

REMARKS

This Amendment and Response is responsive to the Examiner's action mailed March 26, 2003. Reconsideration of the claims as amended, and in view of the following remarks, is respectfully requested.

A. Claims 1-20

Regarding claims 1-20, Applicant disagrees with the office action and requests an interview with the examiner to discuss the rejections.

B. Claims 21-24

Regarding claims 21-24, these claims are a re-presentation of claims submitted on 1999 May 17 with application 09/312,922 ('922) which was incorporated by reference in this application (i.e. 09/470,566) ('566) which was filed on 1999 Dec 22. The corresponding claims have been cancelled from the '922 application due to a restriction requirement (i.e. they claimed a separate invention—the invention of this '566 application). Claims 21-24 are not new matter because they and their supporting subject matter were included in the original '566 application by the following reference, "Our co-pending U.S. patent application Serial Number [09/312,922] filed on 1999 May 17, and entitled 'SYSTEM FOR TRANSMITTING VIDEO IMAGES OVER A COMPUTER NETWORK TO A REMOTE RECEIVER' claims portions of the invention of this application..." (see page 2 of original '566 application).

A copy of the '992 specification and claims as originally filed is provided for convenience.

C. Discussion of Claims

Applicants submit that claims 21 through 24 should be allowable as written.

Note that claims 21 through 24 are the same as claims 28 through 31 that were submitted on 17 May 1999 with application 09/312,922 (with the correction of an obvious error in claim 28(c) now claim 21(c)).

In claim 21(c) the phrase "incrementing a repeat counter if the current line number *does not match* the previous line number" was corrected to read "incrementing a repeat counter if the current line number *matches* the previous line number". This correction is supported by the original disclosure in application 09/312,922 as follows:

- a. In Fig 4A, wherein if the answer to 408 "Is Line Number same as Previous Line Num?" is "yes" flow continues to step 410 "Increment Repeat Counter".
- b. On page 17 line 14-19, "At the step 408, it is determined whether the previous line number for the pixel data is the same as the previous line number... If the line number is the same as the previous line number, the repeat counter value is incremented by one, at step 410."

The addition of these claims is not being made to overcome any prior art rejections, but is being made in response to office actions dated December 17, 2002, and February 18, 2003, in the co-pending '922 application, indicating that the compression method is a distinct invention from its combination with the video transmissions system, and requiring a restriction.

Please note that these claims were examined in conjunction with an International application PCT/US99/10894 filed on 17 May 1999, and published as WO 99/59472 on 25 November 1999. The International Preliminary Examination Report, dated 17 August 2000, indicated that new claims meet the PCT criteria from novelty and inventive step.

~~✓~~ Claims 21 through ²⁴~~25~~ have been re-presented. The features of these claims are novel because, as stated various times above, they are not seen, as specifically claimed in the present invention, in the prior art. Specifically, the present invention embodies systems and methods that allow for fast, real time, and high quality compression of video images. The features of these claims are not obvious and produce superior and or unexpected results from what is found in the prior art. Specifically, by improving the effective compression without the introduction of distortion by conventional compression methods, a number of benefits result, including but not limited to being able to receive an image from a video stream over a connection medium in real-time that could not be received without substantially more distortion, space, bandwidth, or cost.

D. Previous Amendments to the Specification

In addition to a number of self-explanatory clerical errors that were corrected, the specification was amended to better integrate the specification and terminology used in the 09/312,922 application. The two specifications ('922 and '566) were written by two different authors who described distinct embodiments of the subject invention with two distinct sets of terminology. Now that claims using the second set of terms are being transferred to this

application, a table providing a correlation between the two sets of terminology was added to aid examiner and the public.

E. Notes Regarding Terminology

Note that this correlation of terms does not necessarily imply equivalence. For example, the term "5 bit code" of this application is not necessarily equivalent to the term "line number" of the '922 application. The "5 bit code" has a size limitation on the code but does not need to be listed on a particular line in table; for example, it could be a "five bit sample 830". The "line number" is not necessarily limited in size but would be a four bit number if there were 16 lines or a six bit number if there were 64 lines. Thus the correlation of terms is provided as a high level aid, and the terms themselves should be understood based on the respective original specification and their respective embodiments and figures.

Also note that the same term used in this specification in the field of "compression and decompression of video images" is likely to have different meaning in the '922 specification which was written in the field of "video communications systems" and "medical devices". For example in the field of compression the term "image" generally refers to a still image or a single frame of a video, but in the medical device field the term "image" often refers to the collection of all the frames in a video. Thus the terms themselves should be understood based on the respective original specification. The legal presumption that terms in related applications by the same inventors have the same meaning does not apply in this case.

RECONSIDERATION REQUESTED

The undersigned respectfully submits that, in view of the foregoing amendments and remarks, claims 21-24 of the present application are believed to be in condition for allowance. It is respectfully requested that this application be considered, that these claims be allowed, and a Notice of Allowance is respectfully requested. If it is believed that a telephone conversation or face-to-face meeting would expedite the prosecution of the present application, or clarify matters with regard to its allowance, the Examiner is invited to call the undersigned at 408-739-9517.

Respectfully submitted,



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Date: September 25, 2003



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LISTING OF PENDING CLAIMS WITH STATUS

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1. (original) A method of compression of graphic images which make up a video stream, comprising the steps of:

- sub-sampling pixels from an image selected from said graphic images;
- selecting a code based on a number of bits from each pixel selected from said pixels;
- run-length encoding repeated instances of said code;
- repeating steps (b) and (c) until each said pixel is encoded in an encoded data buffer; and
- streaming said buffer which represents said graphic images.

2. (original) The method of claim 1 wherein the rate of sub-sampling frames is greater than or equal to 15.

3. (original) The method of claim 1 wherein image dimensions are less than or equal to 320 by 240.

4. (original) The method of claim 1 wherein said number of bits is five and said code is determined by extracting the five most significant bits from each pixel.

5. (original) The method of claim 1 wherein said number of bits is five and said code is obtained from an encode table.

6. (previously amended) The method of claim 1 wherein an encoded video signal comprises a series of said encoded data buffers.

7. (original) A storage medium in which the encoded video signal as claimed in claim 6 is stored.

8. (original) A method of decompressing an encoded video signal, comprising the steps of:

- reading a stream of run-length encoded codes;
- determining a series of pixels based on the values and run-lengths of said codes;
- combining said pixels into an image; and
- displaying a series of said images.

9. (original) The method of claim 8 wherein the display frame rate is greater than or equal to 15.

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10. (original) The method of claim 8 wherein the width and the height of said image are less than or equal to 320 by 240, respectively.
11. (original) The method of claim 8 wherein said codes are five bits in length and said pixel's values are determined by using the least significant bits of said codes as the five most significant bits of each pixel.
12. (original) The method of claim 8 wherein each of said pixel values are obtained from a decode table, whereby said image is an enhanced representation of the original image.
13. (original) The method of claim 5 wherein the lines of said encode table are randomly ordered forming an encryption table so that the direct correlation between the original values and their representative codes are encrypted.
14. (original) The method of claim 12 wherein the lines of the decode table are ordered in a sequence matching said encryption table so that the correct final pixel values are displayed.
15. (original) A machine for compressing of a plurality of video frames which make up a video signal, comprising
 - (a) a video digitizer configured to digitizing a frame from said video frames;
 - (b) a video memory which is able to receive a plurality of pixels from said video digitizer;
 - (c) run-length encoding circuit for counting repeated instances of a pixel value when scanning said plurality of pixels and output a series of run-lengths and code values as encoded data;
 - (d) a memory which is able to store said encoded data;
 - (e) an input/output device.
16. (original) The machine of claim 15 wherein said run-length encoding circuit performs a table lookup to translate said pixel values into encrypted enhancement codes.
17. (original) The machine of claim 15 wherein said input/output device is a storage medium.
18. (original) The machine of claim 15 wherein said input/output device is a communications transmission channel.

19. (original) A machine for decompressing an stream of encoded data that represents a video signal, comprising:

- an input/output device for reading said stream of encoded data;
- a run-length decoding circuit which can decode the encoded data and output a stream of pixel values; and
- a memory that is able to store an image comprising said stream of pixel values that can be displayed as frames of a video sequence.

20. (original) The machine of claim 19 wherein said run-length decoding circuit performs a decode table lookup.

21. (re-presented—formerly claim 28 of application 09/312,922, previously amended) A method of compressing a stream of data representing a stream of pixels, each pixel having a corresponding illumination intensity value, the method comprising the steps of:

- matching the illumination intensity value representing a pixel with a current line number;
- determining if the current line number matches a previous line number of an immediately prior pixel;
- incrementing a repeat counter if the current line number matches the previous line number;
- encoding a repeat data structure with the repeat counter, if the current line number does not match the previous line number and the repeat counter has a value greater than zero; and
- encoding a line number data structure with the current line number if the current line number does not match the previous line number;

wherein a compressed stream of data is formed from combinations of the line number data structure and the repeat data structure.

22. (re-presented—formerly claim 29 of application 09/312,922) The method according to claim 21 further comprising the step of resetting the repeat counter to zero after the repeat data structure is encoded.

23. (re-presented—formerly claim 30 of application 09/312,922) The method according to claim 21 wherein the repeat data structure and the line number data structure include an identification bit,
wherein when the identification bit is in a first state, a repeat data structure is encoded and when the identification bit is in a second state, a line number data structure is encoded.

24. (re-presented—formerly claim 31 of application 09/312,922) The method according to claim 23 further comprising the steps of:

a. receiving the compressed stream of data, one data structure at a time;

b. reading the identification bit within the data structure to determine if the data structure is a line number data structure or a repeat data structure;

c. generating a representative average illumination intensity value corresponding to the line number if the data structure is a line number data structure; and

d. generating a number of representative average illumination intensity values corresponding to the line number of a last received line number data structure if the data structure is a repeat data structure, wherein the number is equal to the repeat counter within the repeat data structure.